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The utility of the Vineland Adaptive Behavior Scales: Survey form for differentiating between mentally retarded and language impaired pre-school age children.

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The Utility of the Vineland Adaptive Behavior Scales: Survey Form
for Differentiating Between Mentally Retarded and Language
Impaired
Pre-School age Children

by

Penelope A. Hope

B. A. Saint Mary's University

A Thesis

Submitted to the Faculty of Graduate Studies
through the Department of Psychology
in Partial Fulfillment of the
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of Master of Arts at the
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ABSTRACT

This archival study examined the utility of employing the Vineland Adaptive Behavior Scales - Survey Form (Sparrow, Balla, & Cicchetti, 1984) for differentiating language impaired and mentally retarded pre-schoolers. Thirty-seven four and five year olds were included in the study: 13 language impaired, 11 with general cognitive delay, and thirteen clinic controls.

The subjects were classified according to their performance on the Kaufman Assessment Battery for Children (K-ABC) and the presence or absence of expressive and receptive language difficulties. The subscales on the Vineland Adaptive Behavior Scale - Survey Form (VABS-SF) were employed as the dependent variables.

Analysis of Covariance with age as the covariate indicated significant differences between the groups on the Vineland Adaptive Behavior Composite [$F(3,33) = 22.34, p < .0001$]. Post hoc analyses suggested significantly stronger ($p < .001$) overall adaptive skills for control and language impaired than for mentally retarded subjects. A three (group) by four (Vineland subdomain) MANCOVA with age as the covariate indicated a significant effect by group on the combined dependent variables [$F(2,33) = 5.80, p < .0001$]. Univariate and post hoc comparisons indicated consistently weaker skills for mentally retarded subjects, although the socialization mean scores were not significantly different for the retarded and language impaired subjects. The language impaired subjects evidenced significantly weaker skills than did the controls on only one Vineland Domain: Communication.

A discriminant function analysis was also employed. This analysis indicated that on the basis of the Vineland profile, 81.82% of the Mentally Retarded, 76.92% of the language impaired and 61.54% of the control group were correctly classified. Overall, results of this study suggest that the Vineland can differentiate between the language impaired and mentally retarded preschoolers.

CHAPTER 1

Introduction

Given the success of early intervention programs (Simeonsson, Cooper, & Scheiner, 1982), accurate assessment of young children has become increasingly important. The most common developmental problem for which pre-schoolers are referred is suspected language delay (Mattison, Cantwell, & Baker, 1982). Properties of the verbally loaded psychological tests typically used for individual assessment, as well as characteristics of the referred pre-schoolers themselves can complicate diagnostic discriminations that are more easily made in older children. In addition, the test situation itself can create difficulties. For example, it may not be readily apparent whether a reticent three-year old has a language dysfunction, or deficient cognitive skills, or is resistant to the demand characteristics of the testing situation. Supplementing the data from individual tests with a parental report describing the child's usual behavior patterns can help in identifying the possible sources of a child's test behavior. The Vineland Adaptive Behavior Scales (VABS; Sparrow, Balla, & Cicchetti, 1984) offer a well structured, well standardized means of obtaining information from parents regarding their child's usual behavior over a broad range of

everyday activities. The aim of the present study is to determine whether patterns of performance on the VABS are clinically useful in making the diagnostic distinction between specific language delay and general cognitive delay in referred pre-school children.

Thus, although efficacy of early intervention is apparent (Simeonsson et al., 1982), there are difficulties inherent in the assessment of the pre-school age child. A review of the literature indicates that parent report measures may contribute substantially to the reliability and validity of pre-school assessment. Given these factors it is apparent that several areas warrant study. Topics to be examined include: (1) difficulties associated with the assessment of pre-school age children, (2) difficulties in assessing language disordered children, (3) parent report measures supplementing individual test data, (4) adaptive behavior, and (5) the utility of the Vineland Adaptive Behavior Scales for differentiating between various clinical groups.

Challenges of Pre-school Assessment

There is considerable support in the literature for the efficacy of early intervention programs (Marfo & Kysela, 1985; Simeonsson, Cooper, & Sheiner, 1982; Sandow, Clarke, Cox, & Stewart, 1981). The early stages of development are considered to be the most critical with regard to later development (Bloom, 1970; Wachs & Gruen, 1982), and most developmental problems

are detectable as early as three years of age (Del Priore, 1984). Given that early intervention techniques can improve long term prognosis, it is imperative that children receive appropriate assessment and treatment as soon as possible. Clinicians must consider the challenges inherent in assessing such children in order to adequately assess pre-school age children, and initiate the appropriate treatment.

One difficulty associated with pre-school assessment and treatment is that many of the problems causing parental distress are considered normal aspects of child development which will dissipate as the child matures. As many difficulties tend to resolve with increasing maturity, some researchers are concerned that intervention may, in some instances, occur too early, before the child has the opportunity to overcome these problems on his/her own. Such interventions may not only lack therapeutic value, but may in fact be detrimental (Campbell, Szumowski, Ewing, Gluck, & Breaux, 1982). However, there is evidence (Blackman & Levine, 1987) that many of the problems experienced by pre-school age children do not resolve spontaneously. Although it is difficult to determine which behaviors are considered deviant for pre-school aged children, differentiating between children who have potentially chronic problems and those whose problems will resolve themselves is fundamental when assessing a child's abilities (Achenbach, Edelbrock, & Howell, 1987). Accurate assessments may yield

information which will assist clinicians in determining which behaviors will probably resolve spontaneously and which are in need of treatment (Achenbach et al., 1987).

Individual assessment is the most common and reliable method for determining whether intervention is necessary for school age children. However, many difficulties exist with the formal assessment of pre-schoolers. The assessment of the school age group is facilitated by the availability of information concerning the typical acquisition of basic skills and abilities. Conversely, pre-schoolers are learning new skills more rapidly than older children, but do not have as common an experiential background. Consequently, pre-school age children do not acquire a common pool of knowledge from which clinicians are able to draw test items.

As a result of the effect of age differences on skill acquisition during the early years, it is difficult to ascertain what behaviors can be considered normal for any specific age. For example; it is considered normal for 2 to 3 year olds to stutter; however, such behavior in 5 to 6 year olds is normal only if the child is attempting to learn new words. Thus, developmental differences in language, motivation, and level of thinking skills make it difficult to obtain reliable test performance with pre-schoolers, and to predict future disabilities or school problems (Ulrey, 1982).

The problems surrounding pre-school assessment arise primarily from the inability of the child to fully comprehend or comply with the sort of behavior expected by the examiner. Consequently, the child may not work to his/her full potential or within the limits imposed by the testing situation. Although such problems exist for all pre-school age children, they tend to be heightened for impaired children, such that some young children are not testable (Yule & Rutter, 1987).

For most assessment tools, validity or reliability presume a motivation to succeed (Ulrey & Schnell, 1982). Generally, pre-school age children have not been exposed to school, where testing situations are very familiar, and therefore they are often not motivated to succeed in such situations. Pre-school age children are also very egocentric, demonstrating a lack of concern as to how others perceive their responses (Ulrey & Rogers, 1982). During testing, young children will often talk considerably and play with the test items instead of working to task. Some children work slowly and carefully; others are easily bored or highly distractible. Such test behavior may adversely affect the reliability and validity of standardized assessment tools. Thus, some question exists as to whether or not speeded tests truly measure the child's ability to perform.

Many cognitive assessment techniques rely heavily on language or verbal responses to questions, so that pre-schoolers with a language impairment may be at a disadvantage (Yule &

Rutter, 1987). If cognitive assessment techniques do not take into account possible language impairment, such children may be misdiagnosed (e. g., as mentally retarded).

Language disorder is one of the most common presenting problems in pre-school age children (Aram & Nation, 1980). Children with language impairment are often unable to perform to their potential due to the nature of the available tests. There are few psychometrically sound language tests available, and due to the nature of the impairment, language impaired children are often unable to perform optimally on standardized intelligence measures. Consequently, it is difficult to accurately assess language impaired children with many of the language and cognitive measures currently available.

Assessment of Language Disorders

According to Coplan, Gleason, Ryan, Burke, and Williams (1982), a delay in the acquisition of early language milestones is indicative of some kind of developmental disability. These authors assert that if any kind of speech and language delay is evident during the first three years of the child's development, there is probably some accompanying delay present. If true identifying such delays would provide an early indication of a developmental disorder. Despite the frequency and

adverse implications of early language delays, at present few language screening measures exist (Coplan et al., 1982).

In a cognitive assessment, standardized measures, although not used in isolation, tend to be the assessment tools of choice. In the case of speech and language assessment, results from standardized tests will answer specific questions, but results obtained by these measures rarely provide an adequate basis for planning therapy (Ulrey, 1982). Additional data come from language samples that are described and analyzed according to the specific linguistic skill in question. In language assessment, the following nine areas of linguistic skill are analyzed: (1) language function, (2) frequency and spontaneity, (3) comprehension and perception, (4) vocabulary, (5) articulation of speech sounds (phonology), (6) grammar (syntax and morphology), (7) voice quality, (8) oral motor skills, and (9) fluency. In analyzing these areas of language development, the speech and language pathologist attempts to measure the competence and performance gap by distinguishing between language that is typical for the child (performance) and the child's optimum performance (competence) (Weber, Kushnir, & Weber, 1982).

Speech and language therapists rely mainly on the analysis of language samples for diagnosis and treatment, and they base a large number of clinical decisions on their clinical experience. Consequently, it is difficult to standardize the

assessment techniques that are employed. Reliance on experienced clinical judgement dictates that the assessor must work directly with the child rather than relying on parent or teacher reports of language usage. This can create difficulties with language assessment (Ulrey, 1982). Language assessments are time consuming. They are also restricted in that they do not include language usage that may occur outside of the language assessment session. In order to adequately assess the child's language abilities, a large number of assessment sessions may be needed.

Speech and language therapists supplement their clinical analysis of speech samples by the use of standardized tests designed to measure level of language functioning. There are two limitations with the use of such instruments: (1) few standardized tests for language impaired children are available at the pre-school level, and (2) of those existing measures, most lack good psychometric properties (Yule & Rutter, 1987). Accordingly, as many aspects of language cannot be measured with standardized instruments, the speech and language therapist must meet with the child and the parents in an attempt to determine where the child's weaknesses lie, and what test may be appropriate (Bloom & Laher, 1978). There is a need for valid and reliable testing procedures for the language impaired. Speech pathologists will often administer individual subtests of standardized measures, or will alter the administration

procedures of existing tests so that the language impaired child can be assessed (Nation & Aram, 1984). Employing such assessment procedures results in qualitative, rather than standardized, estimates of linguistic skills (Nation & Aram, 1984). As with other individual assessment tools, non-linguistic variables may also affect language test performance (Allen, Bliss, & Timmons, 1981). Such variables as attention span, level of rapport, and level of distractibility may interfere with performance and have a substantial effect on the reliability and validity of test results.

As few language screening measures exist, speech and language therapists base a large number of clinical decisions on the analysis of language samples, and on their clinical experience. One limitation with this approach is that such language assessments do not allow for language usage that occurs outside of language assessment sessions.

Clinicians attempt to gauge language usage outside of the assessment session through the use of standardized tests designed to measure level of language functioning. However, due to the limitations associated with language assessment instruments, there exists a need for more valid and reliable testing procedures for language impaired children. Such difficulties, coupled with the problems inherent in assessing pre-school age children, may compromise valid assessment of the pre-school age child. Consequently, an alternate method of

assessment, which serves to supplement the individual test data with more reliable information, would be useful. For this reason the parent report may be a viable tool in the assessment of pre-school age children.

Reliability of the Parent Report

In addition to individual testing of the child, assessments may include parent or teacher rating scales. Such scales are designed to measure and quantify the child's behavior as seen by the parent (especially in the case of pre-school age children) and/or the teacher. There are several advantages to employing parent report measures for assessment purposes. Parent report rating scales are useful for reducing the amount of time that the clinician must spend with his/her client. Some rating scales can be completed by the parents at home, thereby allowing the clinician to determine in which areas of development the child is having difficulty prior to directly assessing the child. In addition, such measures can yield more information concerning the child than can be observed in an assessment (Honzik, 1984). Furthermore, rating scales completed at home allow the parents to feel that they are contributing in the assessment of their child (Byrne, Backman, & Smith, 1986).

Many rating scales are arranged to minimize the downplaying or exaggeration of the child's behavior. When rating

scales are clear and carefully worded, parents have been shown to be reliable and valid observers of their children's current behavior (Eisert, Specto, Shankaran, Feigenbaum, & Szego, 1980; Frankenburg, Van-Doorninck, Liddell, & Diek, 1976; Knobloch, Stevens, Malone, Ellison, & Risenberg, 1979). In addition, many of the threats to reliability and validity inherent in direct assessment techniques can be avoided by using parent report rating scales (Campbell et al., 1982). Assessing the pre-school age child suspected of having some developmental delay is challenging, as it may be difficult to accurately assess a child's developmental status in a short period of time (Honzik, 1984; Ulrey & Rogers, 1982). Thus, employing a measure to obtain a parent's observations of a child's typical behavior may yield more valid information pertaining to the child's development (Byrne, Backman, & Smith, 1986).

Studies have been undertaken to determine whether parent report measures yield reliable and valid information that may augment the cognitive assessment techniques currently employed with pre-school age children (Eisert, Spector, Shankara, Faigenbaum, & Szego, 1980; Warren, Ilgen, Van Bougondian & Konanc, 1986). In fact, Edelbrock, Costello, Dulean, Kalas, and Conover, (1985) indicate that a parent report of behavior is more reliable than the child's self-report; especially for younger children.

Eisert et al. (1980) found that results from parent report measures and information obtained through the use of various intelligence measures were correlated with aspects of the intelligence tests (e.g. physical abilities and self help skills). Eisert et al. concluded that as there was a high level of agreement between the intelligence tests' results and the results of the parent report measures, the parent report is a reliable and valid method of obtaining information and facilitates the screening of developmental problems. Of the intellectual measures employed, the parent report correlates most highly with the McCarthy and the Stanford-Binet. The partial correlations of .41 to .84 are significant at the $p < .01$ to $p < .05$ level. The parent report (Minnesota Child Development Inventory) which assesses motor, social, language, and self-help development, reflects the results obtained through the use of the intelligence measures. Consequently, the parent report appears to be a valid measure of a child's development and can be used to augment the available assessment procedures.

Costello, Edelbrock, and Costello (1985) studied the validity of the NIMH Diagnostic Interview Schedule for Children (DISC), a parent report designed to operationalize DSM-III diagnostic criteria. The authors compared the ability of parents and children to discriminate between children with psychiatric difficulties. The validity of the parent and child report were investigated, employing subjects referred for mental services.

The authors found that the DISC could more adequately discriminate between psychiatric and pediatric referrals than the child's report.

In Costello et al.'s (1985) study the parent and child forms of the DISC were compared to the standardized Child Behavior Checklist. The results of the measures indicated that the parent report was better able to differentiate between the psychiatric and pediatric referrals than the child report. The parent report indicated that the psychiatric referrals had significantly higher symptom scores than the pediatric group in almost all areas of behavior (paired $t = 7.5$, $p < .001$). Consequently, the parent report is able to discriminate between psychiatric and pediatric groups, and is also able to illustrate level of severity for disorders. The results from the DISC correlate highly with the CBCL indicating that parent reports can be valid indicators of a disorder.

Given that the parent report technique appears to be valid and reliable for assessing developmental difficulties, studies have been undertaken to determine whether parent reports yield more reliable and valid information for readily observable symptoms of psychopathology than for more internalized symptoms (Weirson, Forehand, & McCoombs, 1988; Mabe & Treiber, 1989; Rotundo & Hensley, 1985; Moretti, Fine, Haley, & Marriage, 1985). It was concluded that parent report measures

yield more reliable and valid information for observable, objective symptoms of pathology.

Objective Item Content

Researchers have investigated the viability of employing parent report measures to determine the presence or absence of readily observable behavior. Such authors determined that parent report measures could be employed in such a manner through comparing children's reports of their own behavior to parent reports of the same behavior (Wierson, Forehand, & McCoombs, 1988, and Mabe & Treiber, 1989). If a parent report is valid, then some level of agreement between the two sources of information is expected. Wierson et al. (1988) investigated the level of agreement between adolescents' perceptions of conflict and parent reports of conflict. Pearson correlations were conducted between the adolescents' reports and the mothers' and fathers' reports of conflict between the parents. The adolescents' perception of conflict was correlated significantly with the mothers' reports ($r = .43$, $p < .01$), and the fathers' reports ($r = .61$, $p < .05$) of conflict. The high level of agreement between the reports was significantly related to cognitive and social functioning. The authors also investigated whether the parent reports or the adolescent reports of conflict were more important in predicting the social functioning of adolescents. There were no

significant differences between the reports (all z scores < 1.9 , $p > .05$). These findings suggest that both reports of conflict are able to predict adolescent functioning equally well, thereby suggesting that parent reports are valid. Mabe and Treiber (1989) attempted to predict social desirability. The regression analysis indicated that significant contributions were "made by mental age (Beta = $-.66$, $p < .01$), social competence (Beta = $-.23$, $p < .01$), anger (Beta = $-.17$, $p < .05$), and the external scale (Beta = $-.36$, $p < .01$)." (p. 199). These results indicate that "higher scoring on the (social desirability scale) was associated with (1) younger mental age; (2) higher scores on self-reported social competence . . . ; (3) lower scores on self-reported anger . . . ; and (4) lower scores on parent reported externalization behavioral disturbance . . . " (p. 199). Consequently, the authors found that high scores on an independent desirability questionnaire correlated with a low parent report of externalizing behavior for children from six to 16.

Hagekull, Bohlin, and Lindhagen, (1984) compared parent reports of infant behavior with direct observations of children's behavior (e.g. activity, regularity, attentiveness, and manageability). In the first study, the parents filled out the Baby Behavior Questionnaire (BBQ), before and after the independent observer visited the home. Significant correlations between the parent responses and the independent observers were discovered for all scales of the BBQ ranging from $.60$ ($p < .01$) to $.83$ ($p < .001$). In the second study five separate observations were acquired

over a two month period, with the parent report being given before the first and after the final observation. Again significant correlations between the parent reports and the independent direct observation were discovered for all scales. In addition, with the exception of one score, the correlations between the parent reports and the direct observations for the second study were higher than those for the first study ($p < .05$ to $p < .001$). These results indicate that the BBQ parent report is a valid method for determining the presence and absence of observable behavior. In addition there is promise that the BBQ can be employed to differentiate between psychiatric and pediatric referrals.

Parent reports have also been researched to determine if they can distinguish between levels of severity of disorders. Billings, Miller, and Gottlieb (1987) studied the viability of employing parent report measures to differentiate between "normal" children, children with severe rheumatic disease, and children with mild rheumatic disease. The authors noted that parents reported more physical and psychological problems with the severe group than with the mild group ($F = 8.3$, $p < .05$ and $F = 8.6$, $p < .05$ respectively). More adjustment problems (psychological and behavioral) were found with the mild group than with the normal group ($F = 4.9$, $p < .05$). Such studies illustrate that parent report measures can accurately assess observable behavior.

Other researchers investigated the utility of employing parent report measures for more internalized symptoms of psychopathology. These researchers observed that parent report measures did not yield reliable and valid information.

Inferential Item Content

Moretti et al. (1985) and Rotundo et al. (1985) investigated the utility of employing parent reports in the assessment of depression. Moretti et al. found that for children between the ages of eight and 17, there was a poor level of agreement between the child's report and the parent's report pertaining to the symptomatology of depression. The child reports indicated that there were significant differences in the reported level of depression for different disorders ($F = 2.83$ to 5.45 , $p < .05$ to $p < .002$). The parent report, however, was unable to differentiate between the levels of depression for children with affective and non-affective disorders.

Rotundo et al. (1985) noted that the Children's Depression Scale could reliably identify the symptomatology of depression while the parent version of this measure could not. Significant differences existed between the depressed and non-depressed groups for all the child report measures ($F = 3.2$ to 5.1 , $p < .05$ to $.01$). However, there were no such differences for the parent report measures. Consequently, it appears that the child's

report of his/her own depression is a more valid indicator of depression than the parent report.

In summary, it appears that the parent report measures tend to yield more reliable and valid information for external, observable behaviors than for internal processes requiring inferential judgement. Parents were more accurate in reporting readily observable problems, yet tended to under-report internalizing concerns.

Item Construction

The majority of parent report measures are in the form of checklists or open-ended interviews. Research suggests that the open ended interview yields more accurate and unbiased information than the more structured rating scales (Bloom & Lahey, 1978).

One limitation of rating scales that must be taken into account is the typical avoidance of responding to either extreme on such scales (Yule & Rutter, 1987). This complication can be avoided by questioning the parent rather than giving the parent a checklist to complete. For a variety of reasons, it is not unusual for parents to want their child to appear better or worse than he/she is in actuality. Consequently, asking more open-ended questions may enable the assessor to obtain more accurate information from the parents. Some tests are actually geared

towards answering more general questions to keep self-serving responses to a minimum. When using parent reports in speech assessment, clinicians must exercise care in determining what information is accepted as accurate. Questions asked of parents must be very specific, as parents tend to interpret babble as recognizable speech. For example, many parents hear the words "mama" and "dada" when no-one else does (Yule & Rutter, 1987; Bloom & Lahey, 1978).

As with other measures, rating scales must not be used in isolation, as they fail to provide an integrated picture of the child. However, when used in conjunction with other measures, they afford the assessor an opportunity to acquire a more rounded, valid picture of the child. In summary, parent report measures appear to be most reliable and useful when they are of an open ended nature, and when they are designed to measure observable and objective symptoms of psychopathology.

Adaptive Behavior

The use of parent-report measures as a source of supplementary information may help to overcome many of the difficulties inherent in the assessment of the pre-school age child. Although individual test data and information from parent-reports yield valuable diagnostic information pertaining to the pre-school age child, many of these measures are concerned solely

with the difficulties a child experiences. Early intervention techniques have been shown to be useful when attempting to help children develop their resources and attain their full potential as they mature. Consequently, assessing a child's capabilities as well as his/her difficulties may assist in determining the appropriate intervention techniques for different groups of children. If different groups of children have different strengths and abilities, then appropriate intervention programs may be constructed to build on such strengths to help the child interact more successfully with his/her environment. For this reason an assessment of a child's level of adaptive behavior can add relevant information in an assessment of the pre-school age child (Plenck & Hinchey, 1985).

Doll (1935, 1965) was concerned with assessing children's strengths, especially in those individuals who were deemed to be mentally retarded. Doll believed that the primary focus should be on the individual's ability to adequately care for him/herself and to function in society. Thus, he viewed assessments as incomplete if they failed to include estimates of adaptive behavior. During this time, however, the prime criterion for assessing mentally retarded children was intelligence as levels of adaptive behavior were not considered part of the definition of "mental retardation". As a consequence, mentally retarded individuals were grouped as one, regardless of social competence or adequacy. Consequently, the socially adequate individuals

were not encouraged to promote themselves and improve their abilities (Doll, 1966).

In 1961, the American Association on Mental Deficiency accepted that a single IQ measure was inappropriate for determining mental retardation. In the association's revised manual of terminology and classification, it was specified that in order to diagnose mental retardation, deficiencies in both measured intelligence and adaptive behavior must be demonstrated (Nihira, 1973). This specification became law in the United States with the Education for All Handicapped Children Act of 1975, which states that in order for funding to be given to programs for the mentally retarded, a deficit in adaptive behavior must be apparent (Scheernberger, 1987). Consequently, there has been a renewed concern with the role that adaptive behavior plays in classification, definition, and treatment.

Adaptive behavior is an omnibus concept. Primarily, adaptive behavior refers to how effectively an individual copes with and adapts to his/her natural and social environment. An individual's level of coping or adaptation is defined in terms of: (1) how well an individual can function independently and cope with daily activities, and (2) how well an individual can act in a responsible manner in light of existing societal and cultural demands (Sattler, 1988). Thus, there are two major aspects of adaptive behavior: personal independence and a culturally oriented sense of personal and social responsibility (Ninira, 1973).

The performance of activities which demonstrate adaptive behavior is age related, with children of differing ages manifesting different adaptive behaviors (Doll, 1965). Generally, in infancy and early childhood, adaptive behavior is measured in terms of a child's abilities in the areas of: communication, socialization, self-help, and sensorimotor skills. For example, preschool age children who are able to dress themselves and play with other children are acting in an adaptive fashion. In later childhood, adaptive behavior is measured in terms of social skills, academic skills, and the individual's ability to apply reasoning and judgement skills to his/her environment. Adolescents' adaptive behaviors are measured in terms of their vocation, and their ability to be responsible individuals in their society (Sattler, 1988). For example, adolescents who are able to hold down jobs and interact appropriately with adults are expressing adaptive behaviors.

It might seem from the definition of adaptive behavior that it is very close to being synonymous with intelligence (Keith, Fehrmann, Harrison, & Pottebaum, 1987). The fact that there is some similarity is supported by studies showing a moderate range (.4 - .6) of correlation (Lambert, 1978; Kicklighter, Bailey, & Richmond, 1980). However, there are differences between intelligence and adaptive behavior that indicate that they are not just different aspects of the same construct. Adaptive behavior and intelligence are distinguishable on at least three points: (1)

adaptive behavior is concerned with an individual's everyday behavior and performance while intelligence refers more to the individual's ability to think and process information; (2) adaptive behavior is concerned with how an individual acts generally or typically while intelligence pertains to an individual's best performance; and (3) adaptive behavior is concerned with practical, daily activities while intelligence refers to what information an individual has acquired and the more abstract aspects of living (Sattler, 1988).

Adaptive behavior differs from standard measures of intelligence in that it is defined by one's typical performance, not by one's capability. In other words, if someone is capable but does not act, then that individual is not behaving adaptively. The presence or absence of adaptive behaviors is determined by other people and defined by the expectations and standards of others. Thus, society determines what behaviors are considered to be adaptive; the individual does not.

The relationship between intelligence and adaptive behavior is ambiguous. A great deal of variability in correlations between adaptive behavior and intelligence have been reported, depending on the measures used (Reschly, 1982). Some studies have suggested that there are as many different relations between adaptive behavior and intelligence as there are measures for the two constructs (Keith et al. 1987).

A child's level of adaptive behavior is of obvious importance when defining the limitations and strengths of children experiencing mental retardation and/or a language impairment. It is therefore important to evaluate the levels of adaptive behavior in children, not only to determine those abilities therapy can build upon, but also to facilitate the process of differentiating between clinical groups.

There has been research that supports the use of adaptive behavior measures for discriminating between clinical and non-clinical groups. Garrity and Servos (1978) investigated whether behavior problem (withdrawn and acting out) and non-problem pre-school children performed differently on six commonly used measures of adaptive behavior. The six measures evaluated were: the Teacher Rating Scale (TRS; Grossman & Levy, 1974), the AML Behavior Rating Scale (AML; Brownbridge & Van Vleet, 1969), the Classroom Adjustment Rating Scale (CARS), the Ottawa School Behavior Survey (SBS; Dimm & McClure, 1966), the Minnesota Child Development Inventory (MCDI; Ireton & Thwing, 1972) and the Denver Developmental Screening Test (DDST; Frankenburg & Dodds, 1967). The groups were matched on both chronological and mental age in order to control for any bias in favor of the non-problem population. It was hypothesized that the problem children would evidence higher scores on the TRS, AML, CARS and the SBS (which suggests greater maladjustment); lower developmental age on the MCDI, and developmental delays

on the DDST. Differences between the problem and non-problem groups were demonstrated with a discriminant function analysis indicating that 69 % of problem children and 91% of non-problem children were correctly classified. It should be noted that the problem children had not been institutionalized; they attended normal day care centres and were not involved in any form of treatment. A true "clinical" group was thus not used in this study; perhaps the rate of correct classification would increase if random sampling of the pre-school population had been employed (Garrity & Servos, 1978).

Sparrow, Rescorla, Provence, Condan, Goudreau, and Cicchetti (1986), also evaluated adaptive functioning in "atypical" and "typical" children. The "atypical" children had symptoms indicative of Pervasive Developmental Disorder (PDD), and the "typical" children were considered to be normal. Comprehensive assessments were completed on these children both during pre-school, and also seven years after the initial assessment. The Vineland Adaptive Behavior Scale (VABS) was the instrument of choice in measuring adaptive behavior. Through the use of the VABS, the authors found that the normal children had higher levels of adaptive functioning than the atypical children in the following areas: communication, daily living skills, socialization, and overall adaptive behavior. Also normal children evidenced fewer maladaptive behaviors than did the atypical children.

The results of the Garrity and Servos (1978) and Sparrow et al., (1968) studies suggest that adaptive behavior measures are useful for discriminating between children with developmental problems and children without such problems. The present study will examine whether measures of adaptive behavior may be useful for making finer distinctions between general and specific developmental problems. Specifically, the present study will examine whether adaptive behavior assessment facilitates differentiation of general cognitive delay and specific language impairment.

Measures of Adaptive Behavior

There are many adaptive behavior measures available. Evans and Bradley-Johnson (1988) reviewed six recently developed measures of adaptive behavior in order to determine their technical adequacy and their appropriate usage. The six measures reviewed were: The Adaptive Behavior Inventory (ABI; Brown & Leigh, 1986), the Adaptive Behavior Scale: School Edition (ABS:SE; Lambert & Windmiller, 1981), the Comprehensive Test of Adaptive Behavior (CTAB; Adams, 1984), Scale of Independent Behavior (SIB; Bruininks, Woodcock, Weatherman & Hill, 1984), the Vineland Adaptive Behavior Scales: Survey Form (Sparrow, Balla, & Cicchetti, 1984), and the Vineland Adaptive Behavior Scales: Classroom Edition (Sparrow, Balla, & Cicchetti, 1985). The

expanded version of the Vineland was not used because it did not have an independent standardization sample. The expanded form uses the norm data from the standardization sample of the survey form of the Vineland.

Evans and Bradley-Johnson (1988) examined the standardization of all six tests. Table 1 presents an overview of the six scales and outlines the different areas assessed by each test. The ABS, SIB and Vineland Survey form are the only three tests which assess all areas outlined in the table.

In Evans and Bradley-Johnson's (1988) review, both parent and teacher report measures were examined. However, for the purposes of the current study, only the results for the parent report measures will be reported here. Of the six aforementioned measures, three are parent-report measures. The authors evaluated these measures by reviewing (1) the number of subjects employed in the various standardization samples, (2) the ratio of males to females employed in the standardization

Table 1

The Six Adaptive Behavior Scales According to Informant, Areas Assessed, and
Number of Items per Area

Scale	Informant	Areas Assessed					
		Self-Care	Communication	Sensory & Motor	Social	Occupation & Academic	Maladaptive Behavior
Adaptive Behavior Inventory (Brown & Leigh, 1986) (5-0 to 18-11)	Teacher	Self-care (30)	Communication (32)	-	Social (30)	Occupation (28) Academic (30)	-
Adaptive Behavior Scale: School Ed. (Lambert & Windmiller, 1981) (3-3 to 17-12)	Teacher	Independent functioning (17)	Language Development (9)	Physical Development (6)	Social (7)	Economic Activity (4) Numbers & Time (3) Provocational (3) Self-direction (5) Responsibility (2)	Aggressive (5) Anti-social vs. social (6)
Comprehensive Test of Adaptive Behavior (Adams, 1984) (5-22)	Teacher or Psychologist	Self-help -male (111) -female (141) Home living skills (135)	(see O & A)	Sensory & Motor Skills (51)	Social (45)	Language & Academic (68) Independent Living Skills (87)	-
Scales of Independent Behavior (Bruininks, Woodcock, Weatherman, & Hill, 1984) (infant to adult)	Appears to be caregiver	Eating (16) Toileting (14) Dressing (118) Self-care (15) Domestic skills (16) Home Community Orientation (16)	Communication (16) Expression (17)	Motor Skills - Gross (17) - Fine (17)	Social (45)	Time and Punctuality (15) Money and value (17) Work skills (16)	problem behavior (8)
Vineland Adaptive Behavior Scales: Survey Form (Sparrow, Balla & Cicchetti, 1984) (birth to 18-11)	Caregiver	Daily Living Skills (92)	Communication (67)	Motor Skills (36)	Social (66)	Tested under other domains	maladaptive behavior (36)
Vineland Adaptive Behavior Scales: Classroom Edition (Sparrow, Balla & Cicchetti, 1985) (3-0 to 12-11)	Teacher	Daily Living Skills (99)	Communication (63)	Motor Skills (29)	Social (66)	Tested under other domains	

samples, (3) race and ethnicity, (4) geographic distribution, (5) socio-economic status, (6) and reliability and validity.

Only two of the parent report measures, the CTAB and the Vineland Survey Form, employed an appropriate number of subjects at each age level. The SIB had fewer than 100 subjects at each age level.

All the measures used approximately the same number of males and females, yet only the SIB and the Vineland Survey Form had a proportionate number of White, Black, and Hispanic subjects. The Vineland Survey Form is the only measure that employed a proportional number of subjects from each geographic region. This measure is also the only measure that proportionally represented the census data.

Validity and reliability were also investigated. Although these measures represent attempts to improve the assessment of adaptive behavior, some of the tests have poor psychometric properties. The CTAB does not have a sufficiently large standardization group to be considered an adequate national sample while the standardization sample of the Scale of Independent Behavior (SIB) has an insufficient number of subjects at all the age levels. The SIB also lacks appropriate representation of the various geographic regions and fails to provide any information regarding the subjects' socio-economic status. Along with this is the absence of age level test-retest data.

Lack of test-retest data for each age level is also a problem with the Vineland Survey Form.

While there appears to be adequate validity for all of the tests except for the CTAB, the most valid measures are also the more reliable ones (SIB, and the Vineland Survey Form). Overall, although there are difficulties with all these measures, the strongest current measure of adaptive behavior appears to be the Vineland Survey Form.

The Vineland Adaptive Behavior Scale - Survey Form (VABS-SF)

The VABS-SF is used for a variety of purposes, including: screening, placement and diagnosis. The test yields a general assessment of levels of adaptive behavior, offering information on both strengths and weaknesses. The VABS-SF is given to the primary caregiver, usually the mother, and assesses adaptive behavior for individuals up to 19 years old. The test contains no specific questions. Rather the interviewer elicits information concerning the child through a semi-structured interview. Such interviews consist of general questions about the child's activities followed by more specific probes where warranted

Comprised of 297 items, the VABS-SF assesses the areas of communication, daily living skills, socialization, motor skills, and maladaptive behavior. With the exception of the

maladaptive behavior domain, scores from these areas are combined to calculate an overall adaptive behavior score.

Item development

In developing the items to be included in the Vineland Adaptive Behavior Scales, the authors analyzed the items in the original Vineland Social Maturity Scale (VSMS), and thoroughly reviewed the literature in order to determine the four adaptive behavior domains (Communication, Daily Living Skills, Socialization, and Motor Skills). The authors derived 3,000 items and retained the items if they were easily understandable, were applicable to most individuals, measured the behaviors that were considered to be necessary for appropriate personal and social functioning, could be scored objectively, and could be applied in education and/or treatment programs. After screening with these criteria, the item pool was reduced to approximately 800 items. Following field testing (January to May, 1980), the number of items was again reduced. After further field testing and the refinement of the item pool a national tryout was carried out (July to November, 1980). The data acquired from this pre-test was then utilized to refine test administration, determine an appropriate scoring procedure, and determine item difficulty and discrimination data.

Standardization

Standardization was carried out between September, 1981 and May, 1982. The VABS:SF was administered to 3,000 people; 30 age groups of 100 people each (0 to 18 years, 11 months). Of these thirty age groups, the pre-school age groups were presented in six month intervals. For example, 2-0 to 2-6, 3-7 to 3-11, up to 5-11. The groups were stratified on the variables of age, sex, race, community size, region of the country, and level of parental education. For each of these variables, the data were very close to the census data and were employed with a representative national sample. Additional samples yielded supplementary norms for seven other groups including mentally retarded adults, emotionally disturbed, and visual/hearing impaired samples.

Reliability

The authors of the VABS:SF obtained split-half, test-retest, and inter-rater reliabilities. The split-half reliability procedure was employed for both national and supplementary norms for fifteen age groups. For both sets of norms, reliability coefficients ranged from .70 to .95, with the Adaptive Behavior Composite yielding coefficients between .89 and .98 for the national norms and .98 and .99 for the supplementary norms. Such high correlations lend support to the split-half reliability of

the VABS:SF, as the Rasch-Wright latent trait item procedure was employed to limit false inflation.

Test-retest reliability was measured during the standardization process on 484 parents. The majority of the coefficients obtained were in the .80's and .90's, with coefficients ranging from .77 to .93 for all six age groups employed. Such moderately high coefficients also support the reliability of this measure.

Finally, inter-rater reliability coefficients were determined. Two raters independently scored the responses of the parent for children from the standardization sample, from one to 14 days apart (mean=8). Inter-rater reliability coefficients ranged from .62 to .78. Such lower correlations are are not unexpected in view of the open-ended nature of the test.

Validity

Construct Validity

The authors of the VABS:SF assessed the construct, content, and criterion related validity of this measure. Construct validity is perceived as the most important type of validity, as it is concerned with determining the degree to which an underlying construct is measured. Content and criterion validity also yield evidence for construct validity. With the VABS-SF, the authors were concerned with how well the test actually measures adaptive behavior. As stated earlier, due to Doll's influence, one of the most important aspects of the definition of adaptive behavior is that it is age related: consequently, the scores on the Vineland should increase with age. The authors illustrate that the Vineland scores do increase as a factor of age. For example; in the communication domain mean scores increase from 11.4 for the 0-0 to 0-11 age group to 130.1 for the 16-0 to 18-11 age group. As much as this developmental progression does support the construct validity of the scale, further evidence is needed. Additional support has been obtained through the application of multivariate techniques - principal component and principal factor analysis. Principal component analyses, using the standard scores for various age groups, were conducted. This technique was employed to determine: (1) if there was an underlying adaptive behavior component for each of the domains and

subdomains, and (2) the amount of variance accounted for by this first component. For each age, one significant component was discovered, which accounted for the majority of the variance. Such findings further support usage of the Adaptive Behavior Composite as an overall index of level of adaptive behavior.

Following the component factor analyses, principal factor analyses were employed using the raw scores, controlling for age effects. After an orthogonal rotation was carried out, the results supported the current organization of the items into the various behavior domains.

Content Validity

Content validity assesses the adequacy of the sampling of the behavior defining the construct employed - in this instance, adaptive behavior. The authors contention of adequate content validity is based on the strict item selection techniques employed. As stated previously, a review of the literature in conjunction with clinical judgement was used to derive the initial sample. Rigorous field testing determined what items were appropriate for the various scales, in relation to the authors' definition of adaptive behavior.

Criterion Validity

To assess the criterion related validity of a measure, subjects' scores on the test are compared to the scores obtained on another standard, a criterion, theoretically associated with the behavior of interest. Towards this end, the VABS was compared with intelligence measures and alternative tests of adaptive behavior. During the period of standardization, the authors also administered the Vineland Social Maturity Scale (VSMS) to 389 people from the ages of 6 years to 18-11. Correlations were computed for the Adaptive Behavior Composite, the VSMS Social Quotient, and the Deviation Social Quotient. The correlation between the VABS and the Social Quotient was .55, as was the correlation between the VABS and the Deviation Social Quotient. The authors suggested that this correlation was acceptable, given that much of the item content and the standardization procedure was different in the revised version. Bolen, Childers, and Durham (1984, as cited by Sparrow, Balla, & Cicchetti, 1984) tested mentally retarded adults using both the revised VABS and the VSMS and reported a correlation of .97 between the raw scores of the adaptive behavior domains and the total score on the VSMS. Another study (Altepeter & Moscato, 1982) found a correlation of .88 between the two measures with residential hearing-impaired children, controlling for age. Bernberg and Irons (1986) compared the Vineland Survey Form to the AAMD Adaptive Behavior Scale,

finding that the two measures correlated significantly.

Correlations ranged from .34 to .82 again lending further credence to the contention of validity for the VABS-SF. Goldstein, Waldrep, and Inderbitzen (1987), compared the Woodcock-Johnson Battery's SIB with the VABS-SF using 66 infants with a mean age of twelve months. Correlations of .51 to .79 also serve to substantiate the premise that the Vineland does measure adaptive behavior.

The Vineland was also correlated with various intelligence measures; namely, the PPVT-R and the K-ABC (Kaufman & Kaufman, 1983). As the K-ABC and Vineland were standardized on virtually the same population, the two can be legitimately compared. Correlations between the Adaptive Behavior Composite of the Vineland and the Global Scale standard scores from the K-ABC are generally low, yet high enough to suggest that the two constructs - intelligence and adaptive behavior - are in fact related. Correlations in excess of .55 would give rise to questions concerning the existence of adaptive behavior as a separate construct; therefore, the low correlations between the 2 measures support the validity of the VABS-SF. The VABS-SF was also compared to the PPVT-R. The PPVT-R was administered to over 2000 individuals from the standardization sample. It was expected that the correlations would be low but that the communication domain would have the highest

correlation because of the verbal nature of the subtest. The authors found that the correlations were in the expected direction.

The Vineland Survey Form has also been employed to differentiate between diagnostic groups for school age children and adults. Harrison (1987) reviewed studies which employed the Vineland Survey Form in the investigation of group differences. This author described differences between mentally retarded and non-handicapped adults (Childers & Bolen, 1985), and learning disabled adults (Rainwater - Bryant, 1985). Harrison (1987) noted that mentally retarded individuals scored lower on the Vineland Composite score than did "normal" individuals, and that mentally retarded children scored lower on the Vineland than learning disabled children. The exact pattern fluctuations were not addressed. Such results indicate that the Vineland may be employed to differentiate between clinical groups. However, there is as yet no evidence that significant differences in profile scatter exist within the pre-school population.

The Vineland Survey Form is a carefully developed and well standardized measure of adaptive behavior, yielding normative information for a number of clinical groups. Reliability and validity studies also appear to suggest that the Vineland is currently the most valid and reliable measure of adaptive behavior available. Research has indicated that the Vineland can be employed in the differentiation of various groups. The Vineland appears to be useful in differentiating between mentally

retarded and learning disabled adults as well as mentally retarded and non-handicapped adults. Consequently, it appears that, of those measures reviewed here, the Vineland Survey Form may be the most appropriate adaptive behavior measure available to address the questions examined in the present study.

Purpose of Study

The early identification of developmental difficulties in children is important, as early intervention may reduce the number of problems encountered in the future. The numerous challenges inherent in the assessment of pre-school age children make the determination of appropriate intervention strategies especially problematic.

The use of individual assessment procedures provides valuable information concerning a child's behavior and style of responding in a unique situation. However, given the aforementioned difficulties associated with assessing pre-school age children individually, a supplementary method of assessment appears desirable. Furthermore, as pre-school age assessment and diagnosis of developmental disabilities is difficult and time consuming, especially when dealing directly with the child, the use of a parent report measure can facilitate routine assessments (Byrne, Backman, & Smith, 1986). Given the increased emphasis on the importance of measuring adaptive behavior, a parent

report measure that examines adaptive behavior could be a valuable supplement to an assessment. As the VABS-SF has been used previously to differentiate between typical and atypical children, it may have utility in making even finer distinctions between various clinical groups.

The purpose of this study is to determine whether patterns of performance on the VABS have clinical utility for making the diagnostic distinction between specific language delay and general cognitive delay in referred pre-school aged children. It is hypothesized that the VABS will yield different patterns of performance for the language impaired and cognitively delayed pre-schooler. Due to the nature of the language impaired group, both expressive and receptive language difficulties are expected. As a consequence, it is expected that such children will have difficulties in the area of the Vineland that pertain to language usage and social interaction. The mentally retarded children; however, are expected to have difficulties in all areas of adaptive behavior. For example, such children will probably experience difficulty with social situations, language usage, and with their ability to look after themselves. If such differential patterns of performance exist, identification of the various strengths and weaknesses associated with each clinical group may enable clinicians to implement more appropriate early intervention strategies.

The clinical control group consisted of children with various disorders. Such a group was employed in this study to determine if the profiles for language impaired and mentally retarded children were significantly different from other clinical populations. If such differences exist, it would suggest that there are profiles unique to the language impaired and mentally retarded groups.

Predictions

It is predicted that there will be significant pattern differences between each experimental group and the control group.

(1) Harrison (1987), found that mentally retarded individuals scored lower on the Adaptive Behavior Composite than "normal" children and learning disabled children. Consequently it is expected that the mentally retarded group will score lower (i.e., show less advanced adaptive skills) than the language impaired group, which in turn is expected to score lower than the clinical control group on the Vineland summary measure of adaptive skills, the Adaptive Behavior Composite.

(2) The language impaired group is expected to perform lower than the control group on the Communication domain and possibly on the Socialization Domain. The Socialization domain may be

lower for language impaired subjects than for controls because this domain has a large number of language oriented items.

(3) Mentally retarded individuals experience a general delay in many areas of their development (Nihira,1973). Consequently, the general cognitive delay group is expected to perform lower than the clinical control group on all domains.

CHAPTER II

Method

Subjects

Subjects for this retrospective study were selected from 168 consecutive admissions to the child outpatient program at Windsor Western Hospital's Regional Children Centre. They consisted of thirty-nine 4 and 5 year old children, all of whom had been assessed previously by a psychologist at the aforementioned centre. Subjects were selected if their primary language was English, and they had been assessed with the K-ABC and the Vineland Adaptive Behavior Scales Survey Form. Following this step 84 subjects were eliminated. Of these 84 subjects, 18 were eliminated as they did not meet the criteria for membership into any of the three groups. The subjects which met the criteria for the clinical control group were matched to the two experimental groups on the basis of age, sex, and socio-economic status. Following this procedure 29 subjects were eliminated. From the remaining 37 subjects three groups of children were formed according to the following criteria:

(1) Specific Language Delay (LI)- This group consisted of 13 children with both receptive and expressive language

difficulties, all identified by an experienced speech pathologist. The children in this group had average intelligence, as defined by a score of 80 or above on the Non-Verbal scale of the Kaufman Assessment Battery for Children (K-ABC; Kaufman & Kaufman, 1983) (See Appendix A for a description of the K-ABC).

(2) General Cognitive Delay (MR) - The subjects in this group consisted of 11 children identified as borderline mentally retarded, with language abilities appropriate to IQ. A score of 75 or below on the Mental Processing Composite of the K-ABC was utilized as the criterion for determining inclusion in this group. The subjects had language appropriate to IQ, as identified by an experienced speech pathologist.

(3) Clinical Control Group (Control, CC)- The clinical control group was comprised of 13 children. These children were selected on the basis of age, sex, and socio-economic status. The clinical control group was matched according to age, sex, and socio-economic status, as defined by Hollingshead (1957), with the experimental groups (see Table 2). This group showed no indications of mental retardation or language impairment as defined by the K-ABC and the clinical judgement of an experienced speech pathologist.

Table 2

Hollingshead's Occupation Classifications

Score 9	Higher level executives, Proprietors of big business, and Professionals. e.g. - Architects, Bank Officers, Doctors, Lawyers, Mining Engineers, Psychologists, Veterinarians
Score 8	Administrators, Lesser Professionals, Proprietors of medium sized businesses. e.g. - Accountants, Administrators, Editors, Nurses, Pilots, Teachers, Labor Relations Engineers
Score 7	Smaller business owners, Farm owners, Managers, Minor Professionals. e.g. - Actors, Designers, Painters, Mailpersons, Real Estate agents, Social workers, Counsellors
Score 6	Technicians, Semi-professionals, Small business owners. e.g. - Athletes, Dental hygienists, Foresters, Foremen, Opticians, Photographers, Secretaries.

- Score 5 Clerical and Sales workers, Small farm and business owners.
e.g - Bank Tellers, Cashiers, Collectors, Key punch operators, Telephone operators, Typists
- Score 4 Smaller business owners, Skilled manual workers, Craftsmen and Tenant farmers.
e.g. - Airline attendants, Bakers, Carpenters, Clerks, Police, Jewelers, Repairmen, Tailors, Welders
- Score 3 Machine Operators and Semiskilled Workers.
e.g. - Barbers, Bus Drivers, Chauffeurs, File Clerks, Hairdressers, Nursing Aid, Sailors
- Score 2 Unskilled Workers.
e.g. - Bartenders, Cooks, Garbage Collectors, Gardeners, Laborers, Messengers, Waiters
- Score 1 Farm Laborers/Menial Service Workers.
e.g. - Maids, Attendants, Janitors, Stockhandlers, Vehicle Washers, Ushers
- Score 0 Unemployed/Housewife
-

Procedure

This is a descriptive study. Subjects for the three groups were selected from available archival data (see Table 3). In order to determine the equivalency of the three groups, Analysis of Variance (ANOVA) and Chi-Square were performed. The ANOVA procedure was applied to determine whether the groups differed in terms of age. A one-way ANOVA was performed, with age as the dependent variable. Two Chi-Square tests were then performed; one to determine if the difference of proportion of males and females was significant for each group, and the second to determine if the groups differed in terms of socio-economic status.

Demographic Make-Up of Groups

In order to test that groups did not differ substantially in demographic characteristics, Chi-Square analyses of sex and socio-economic status (mother's and father's occupation) and ANOVA of age were performed. Chi-Square analyses of father's occupation, mother's occupation, and sex were constrained by the small sample size and the large number of occupational categories. There was a significant age effect [$F(2,34) = 3.37$ $p < .04$]. Post hoc Tukey Studentized Range tests indicated that the MR group was

Table 3
Characteristics of the Three Subject Groups

Experimental Groups			
	Language Impaired	Mentally Retarded	Clinical Control
Sex			
Males	10	7	10
Females	3	4	3
IQ			
	89.3*	70.1*	98.3*
	(7.65)	(4.39)	(10.77)
Age			
	56.78*	62.73*	58.38*
	(5.04)	(7.42)	(4.70)
FOC			
	2.17*	2.25*	2.46*
	(0.58)	(0.89)	(1.20)
MOC			
	2.00*	2.18*	2.17*
	(1.48)	(1.72)	(1.19)

* = group mean

() = standard deviation

significantly older than the LI and CC groups, therefore an Analysis of Covariance was performed.

Even though the number of subjects is too small to reliably test differences in father's occupation, the observed Chi-Square value of 5.013 ($df = 8$, $N = 34$) is reassuringly low ($p < .75$). While it is not possible to prove that groups are comparable, direct comparison of the results (Table 4) suggests that there are in fact no meaningful group differences for father's occupation. The majority of scores for all three groups fall in Hollingshead's semi-skilled labour category (Category 2 on the inventory), indicating a similar distribution of occupations (Hollingshead, 1957). Similar frequency distributions were found for the mother's occupation. The Chi-Square value of χ^2 (8 , $N = 35$) = 7.036, $p < .53$, again is a very general indicator and should be interpreted with caution; however, the frequency counts across the various groups were similar (see Table 4). The frequency values suggest that the three groups were equivalent also in terms of mother's occupation.

The Chi-Square Test for differences in the distribution of sex, χ^2 (2 , $N = 37$) = 0.692, $p < .70$, suggests that there was no sex effect. Although similar difficulties exist in applying the Chi-Square technique to sex as to occupation, the frequency distribution of the scores again suggests that there is no sex effect (see Table 5). In summary, the two experimental groups (LI and

Table 4

Chi Square Frequency Distributions

Father's Occupation - Frequency Distribution

Group	Occupational Level				
	1	2	3	4	5
LI	1	8	3	0	0
MR	1	5	1	1	0
CC	2	7	1	2	1
Total	4	20	5	3	1

LI Group - Missing Data = 1

MR Group - Missing Data = 2

CC Group - Missing Data = 0

Note: LI = Language Impairment, MR = Mentally Retarded, CC =
Clinical Control

Table 4 (continued)

Mother's Occupation - Frequency Distribution

Group	Occupational Level					
	1	2	3	4	5	6
LI	7	2	0	2	1	0
MR	6	2	0	2	0	1
CC	4	5	0	3	0	0
Total	17	9	0	7	1	1

LI - Missing Data = 1

MR - Missing Data = 0

CC - Missing Data = 1

Note: LI = Language Impaired, MR = Mentally Retarded, CC =
Clinical Control

Table 5

Chi Square Frequency Distributions for Sex

Group	Sex	
	Male	Female
LI	10	3
MR	7	4
CC	10	3
Total	27	10

Note: LI = Language Impaired, MR = Mentally Retarded, CC = Clincial control

MR) and the clinical control group (CC) were found to be equivalent in terms of age, sex, and socio-economic status. The differences between the groups were so slight that it was concluded that no significant demographic differences exist between the three groups (MR, LI, and Control), and that, with the exception of age, they are comparable for the purposes of this study.

Analysis of Data

Following the determination of group equivalency, the next step was to determine the between group differences. As there are five dependent variables, and the fifth dependent variable (Vineland Adaptive Behavior Composite; VABC) is the composite score of the other four, the between group differences on the VABC variable were analyzed separately. A Multivariate Analysis of Covariance (MANCOVA) with age as the covariate, was performed to determine between group differences for the four Vineland Domains (Communication, VCOM; Daily Living Skills, VDLS; Socialization, VSOC; Motor Skills, VMOTS), and an Analysis of Covariance (ANCOVA) with age as the covariate, was performed to determine between group differences on the VABC variable. Following the MANCOVA and ANCOVA procedures, a discriminant function analysis was performed to determine whether group membership can be predicted on the basis of VABS scores.

CHAPTER III

Results

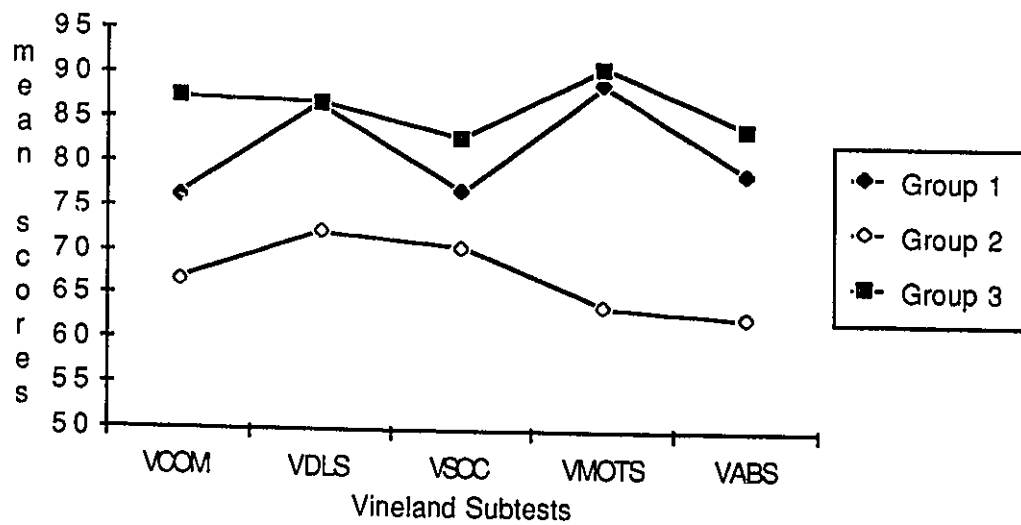
The initial portion of this chapter deals with a detailed discussion pertaining to the adaptive behavior differences between the language impaired (LI), mentally retarded (MR) and clinical control group (CC) children. Finally, the diagnostic capabilities of the Vineland Adaptive Behavior Scale- Survey Form are discussed.

Differences Between the Vineland Scores for the Experimental Groups

To test the prediction that significantly different scores exist for LI and MR children, as compared to the clinical control group, Multivariate Analysis of Covariance (MANCOVA) and separate one-way Analysis of Covariance (ANCOVA) tests were performed. The differences in subtest scores are illustrated in Figure 1.

The overall MANCOVA results indicate that significant differences exist between the groups ($F(2,33)$, 5.80, $p < .0001$). The significant differences for the individual variables are shown

Figure 1. Between and Within Group Differences



Vineland Profiles for the three groups: Group 1 - Language Impaired; Group 2 - Mentally Retarded; Group 3 - Clinical Control.

in Table 6. For the VCOM variable, significant differences between the groups were found at the $p < .0001$ level ($F(3, 33) = 11.71$); for the VDLS variable, differences were found at the $p < .0021$ level ($F(3, 33) = 6.09$); for the VSOC variable, differences were significant at the $p < .0077$ level ($F(3, 33) = 4.69$); and for the VMOTS variable, differences were significant at the $p < .0001$ level ($F(3, 33) = 11.93$). Between group differences for the VABC variable were significant at the $F(3, 33) = 22.34$, $p < .0001$ level.

It is apparent, therefore that overall differences in adaptive behavior do exist between the groups. A post hoc Tukey's studentized range analysis of differences among group means for each variable indicated the exact differences between the groups (see Table 6).

A) Differences Between the Language Impaired and Clinical Control Groups.

The results indicate that there were no significant differences between the language impaired group and clinical control group except in the area of communication (see Table 6). The mean score for the language impaired group on this variable, 76.30, was significantly lower than the mean score for the control group, 87.30 ($F(2,33) = 11.71$, $p < .0001$). Therefore, the prediction that the language impaired (LI) group would receive lower scores

Table 6

Tukey's Analysis of Between Group Differences for Each
Dependent Variable

Dependent Univariate F's Variable F(2,33)	Groups			
	Language		Mentally	Clinical
	Impaired	Retarded		Control
VCOM	76.307a (8.966)	66.909b (6.171)	87.307c (10.640)	11.71**
VDLS	86.692a (11.919)	72.363b (10.975)	86.923a (12.533)	6.09*
VSOC	77.076ab (7.499)	70.636a (6.712)	83.078b (9.331)	4.69*
VMOTS	89.076a (11.75)	64.0b (13.379)	91.00a (11.291)	11.93**
VABC	79.153a (8.081)	62.818b (6.69)	84.076a (4.716)	22.34**

Note - Means with the same subscript are not significantly different

* $p < .01$ ** $p < .0001$

than the control group on the communication variable was supported. The LI group, however, did not score significantly lower on the Socialization subtest as was expected.

B) Differences Between the Mentally Retarded and Clinical Control Groups

As predicted, the mentally retarded group scored significantly lower than the clinical control group for all dependent variables ($p < .05$). In addition, although it was not specifically predicted, results of the between-groups measures showed the LI group scored significantly higher than the MR group on all dependent variables with the exception of the socialization variable (see Appendix B)

Diagnostic Capabilities

After the group differences had been investigated, a discriminant function analysis was performed to determine whether the Vineland could be used to predict group membership. The discriminant analysis indicated that, on the basis of the Vineland profile, 81.82 % of the mentally retarded group, 76.92 % of the language impaired and 61.54 % of the clinical control group were correctly classified. These values indicate that the differences in the dependent variables were not likely to have

occurred by chance as the prior probabilities for group membership were $p = .333$ (see Table 7).

For the language impaired group, three subjects were mis-classified, two as clinical control subjects and one as a mentally retarded subject. For the mentally retarded group the two subjects who were mis-classified were classified as language impaired. Finally, for the clinical control group all five of the mis-classified subjects were classified as members of the language impaired group.

Table 7

Discriminant Function Classifications

Actual Grouping	Predicted Group Membership		
	1	2	3
(1) Language Impaired	10 76.9 %	1 7.7 %	2 15.4%
(2) Mentally Retarded	2 18.2%	9 81.8%	0 0.0%
(3) Clinical Control	5 38.4%	0 0.0%	8 61.5 %

CHAPTER IV

Discussion

The present study was undertaken in order to determine whether the Vineland Adaptive Behavior Scales - Survey Form scores could be useful in distinguishing mentally retarded from language impaired pre school children. As discussed previously, early intervention is advisable for preschool age children experiencing developmental difficulties. Consequently, it is necessary to accurately assess pre-school age children as early as possible. Currently, however, the differences in developmental level and experience among pre-school age children make it difficult to accurately assess such children. Due to the developmental differences in language, motivation, and level of thinking skills, it is often difficult to obtain reliable test performance. Obtaining reliable results on current standardized measures presumes a motivation to succeed on the part of the client. Pre-school age children often do not attend to the tasks at hand, or to the assessors' demands. Consequently, the reliability of the test results may be questionable, making it difficult to predict future disabilities from the assessment of pre-school age children.

As discussed in the literature review, conventional assessment techniques typically involve heavy demands on

language skills, placing language impaired children at a disadvantage. Thus, relying on conventional techniques exclusively may result in biased, invalid assessments such as misdiagnosis of language impaired children as mentally retarded. It is apparent from the results of this study that the Vineland can augment the existing assessment procedures to facilitate more accurate diagnoses of mental retardation and language impairment in young children.

The Vineland can be usefully employed to overcome many of the difficulties associated with the assessment of pre-school age children. As the parent serves as the respondent on the Vineland, the threats to validity and reliability inherent in the direct assessment of the child are overcome. The Vineland overcomes the motivational and behavioral difficulties associated with the direct assessment of the child. In addition, the Vineland measures directly observable behavior and supplements the traditional assessment techniques with a measure of adaptive behavior.

Many parent reports take the form of checklists. The Vineland employs a semi-structured, open-ended approach to data gathering that allows for less biased information. The open-ended instrument also rates directly observable behavior. Research has indicated that the validity of parent report is maximized when requested information consists of objective, readily observable behavior.

The Vineland has been shown to be a reliable and valid assessment instrument (Sparrow, Bella, & Cicchetti, 1984; Altpeter & Moscato, 1980). The properties of the instrument along with it being a parent report measure, increases the reliability and validity of the assessment of pre-schoolers. The results of this study suggest that the Vineland may be useful, in conjunction with conventional assessment techniques, for differentiating LI and MR preschoolers

Differential Diagnosis

The results suggest that the Vineland Adaptive Behavior Scale - Survey Form may be useful in distinguishing between language impaired, mentally retarded and clinical control groups. Significant differences existed between the mean scores of the language impaired group and clinical control group, and between the mentally retarded group and clinical control group.

The reliability of these group differences was further supported by the results of the discriminant function analysis in which the majority of clinic children were correctly classified. In the context of a full assessment battery (e.g. IQ test supplemented by the Vineland), only one of these classification errors would possibly result. That is, the one LI subject classified as MR on the Vineland might also be misclassified as MR on the basis of a traditional language based IQ test; whereas, the two MR

children misclassified as LI on the basis of the Vineland would very likely be correctly classified with the addition of an IQ test.

Limitations

Although these results suggest that the Vineland has some utility as a diagnostic instrument, there are several limitations to the current research that must be addressed. Firstly, with the small number of subjects employed in this study it was difficult to test definitively whether the three groups were equivalent in terms of the demographic variables. However, the Chi square tests and the frequency distributions do strongly suggest that the three groups are in fact comparable in terms of socio-economic status and sex. The mentally retarded group was significantly different from the other two groups in terms of age; however, an ANCOVA was performed to partial out the age effect.

In addition the small sample size may have affected the significance of the test of differences between the language impaired and the control groups. Replicating this study with a larger sample may increase the percentage of correctly classified language impaired subjects above the 77 percent level found in this study. However, even with the small group sample sizes, the mentally retarded group was 82 percent correctly classified; only two of the mentally retarded group was classified as language impaired and only one of the language impaired group was

classified as mentally retarded. The overall differences between the three groups was significant at $p < .0077$ to $p < .0001$.

The MANCOVA and discrimination techniques are very sensitive to the effect of outliers (Rosenthal & Rosnow, 1984). Due to the small sample size the effect of the outlier cases was not controlled. With the MANCOVA technique, this increases the chance of either Type 1 or Type 2 error. It is impossible to tell which type of error is affecting the results. Consequently, the results must be viewed with caution.

Cross-validation of the results was also not possible at the time of this study. Employing cross-validation techniques is necessary as it is desirable to determine how well the results would generalize to a new sample of cases. The coefficients usually work very well for the sample from which they are derived, therefore, employing a new sample will yield a more accurate estimate of the actual relationship between the dependent and independent variables.

There are some restrictions in the data. The data were acquired from files at the Regional Children's Center of the Windsor Western Hospital. The files were generated over a period of time and therefore there may be inconsistencies within the data. Furthermore, the assessment tools which were used were administered by more than one person, and there may be an interviewer effect. One of the difficulties in employing the

Vineland scales is that the open-ended nature of the instrument does not allow for a strictly standardized method of application.

In summary, although there are some limitations to this study, the results suggest that the Vineland is a valuable assessment tool for facilitating the sometimes difficult diagnostic distinction between young children with a general developmental delay and those with specific language delay. While the Vineland cannot be used as an effective diagnostic tool in isolation, it can be used to advantage to supplement other measures. In a complete test battery, the Vineland may yield information that can assist in an accurate diagnosis.

Directions for Future Research

Future research should attempt to replicate these results employing larger sample sizes, and employing a true mentally retarded group. The use of a larger sample size would enable researchers to determine the score differences between the experimental groups employed in this study while controlling for the effect of outliers. In addition, employing a larger sample would allow for more definite statements to be made about the group differences, as a larger sample size would increase the power of the statistical tests employed.

This study employed a borderline mentally retarded group, and as such the results may not be generalizable to a true

mentally retarded population. However, the fact that differences between the mentally retarded and clinical control group were demonstrated for borderline mentally retarded children, suggests that perhaps stronger differences exist for more profoundly retarded children.

As discussed in the limitation section, no cross validation techniques were employed in this study. Consequently, future research should attempt cross-validation of these results employing an independent sample of language impaired and mentally retarded children.

Future research should also investigate the profile scatter for the domain and subdomain scores. Investigating the within-domain differences would serve to clarify the exact tasks that mentally retarded and language impaired children are able to perform with relatively little effort. Such findings could assist in developing appropriate therapeutic intervention techniques.

As this study indicates that the Vineland can be employed as a diagnostic measure, similar research should be repeated with other clinical groups to determine whether significantly different profiles exist for other clinical populations. If such profiles do exist then the information they would provide could supplement current diagnostic and intervention techniques.

Appendix A

The Kaufman Assessment Battery for Children (K-ABC)

The K-ABC, first published in 1983 (Kaufman & Kaufman, 1983), is an individually administered measure designed to assess intelligence and level of achievement in children from the ages of 2 1/2 to 12 1/2. The K-ABC originated from a strong theoretical base, and is employed primarily to derive information that can be employed for intervention purposes. The measure is easy to administer and to score, and it is appropriate for use with pre-school aged children, exceptional children, and minority children (Vance & Kutsick, 1983). It is presented in an easel format, and requires a minimum amount of verbal responding for some subtests.

In general, the K-ABC has been shown to have good reliability and validity (Kaufman & Kaufman, 1983); however, for the purposes of this study the emphasis is on the Mental Processing Composite and the Non-verbal Scale.

Mental Processing Scale

Researchers who have investigated the K-ABC have been particularly interested in the level of agreement reported between the K-ABC and the WISC-R, as the latter has become the

standard by which intelligence measures for children have been judged. Considerable research (Obrzut, Obrzut & Shaw, 1984; Naglieri, 1985; Fourquarean, 1987) has focused on examining the relationship between these two measures. Results generally indicate that the Mental Processing Composite does measure level of intellectual functioning when compared to the WISC-R. Naglieri (1985) reported that the two measures correlated .85 for normal, learning disabled and mentally retarded children with subtest correlations ranging from .65 to .90. Naglieri (1985) also found that there were similar Full Scale IQ scores and Mental Processing Composite scores for borderline mentally retarded individuals. Such results support the author's contention that the K-ABC Mental Processing Composite and the WISC-R Full Scale IQ tend to yield similar scores for mentally retarded children. These findings also support the use of the Mental Processing Composite for the identification of mentally retarded individuals.

Non-verbal Subtest

The Non-verbal subtest of the K-ABC for four year olds, is composed of 3 subtests: Face Recognition, Hand Movements, and Triangles. For five year olds, it is composed of the following: Hand Movements, Triangles, Matrix Analogies, and Spatial Memory. A synopsis of each of the subtests is provided below:

(1) Face Recognition: A photo of a face is presented to the child, and following the presentation, the child must then pick out the face that he/she saw from another photo consisting of two faces.

(2) Hand Movements: The child must copy the examiners hand movements in the order that the examiner performed them.

(3) Triangles: The child is presented with a number of identical triangles and must then put them together to match an abstract model.

(4) Matrix Analogies: This subtest measures the child's ability to select the design or picture that best fits and completes a visual 2 by 2 visual analogy.

(5) Spatial Memory: This subtest measures the child's ability to recall where objects had been on a previously exposed page.

The reliability of the Non-verbal subtest has been reported for both split-half reliability and test-retest reliability (Kaufman & Kaufman, 1983). The split-half reliability coefficients range from .74 to .89 for the four year olds, and .78 to .92 for the five year olds. The test-retest reliability coefficients for four year olds have an average of .81 while an average of .82 has been obtained for the 5 year olds. Such high coefficients are indicative of good reliability.

It has been argued that the non-verbal subtest of the K-ABC can be used to measure level of intellectual functioning for language impaired children (Vance & Kutsick, 1983; Porter & Kirby, 1986). It has also been argued that such a subtest yields scores comparable to other non-verbal estimates of level of intellectual functioning. Vance and Kutsick have discussed the viability of employing the Non-verbal Scale on the K-ABC as a measure of intellectual functioning. The authors state that, in their opinion, the Non-verbal Scale can function as a short form of the Mental Processing Composite. This subtest is purported to yield a reliable and valid estimate of intellectual functioning for children 4 to 12-1/2 years of age who have a language disorder.

Porter and Kirby (1986) investigated the utility of employing the Non-verbal Scale in the assessment of intellectual functioning with a group of 49 deaf children from the ages of 7 to 12. The authors divided the children into two groups: (1) those children who received their instructions through the use of pantomime and gestures, and (2) those children who received their instructions through the use of sign language. The children in both groups were given the Weschler Intelligence Scale for Children - Revised (WISC-R) and the Metropolitan Achievement Test (MAT). These measures were given in order to determine the construct validity of the Non-Verbal Scale of the K-ABC. The authors found significant correlations between the Non-verbal Scale of the K-ABC and the WISC-R for both groups. Significant

correlations were also found for the Non-verbal Scale and the Reading Comprehension and Mathematics subtests from the MAT. Such results support the utility of using the Non-verbal Scale to determine level of intellectual functioning for language impaired children.

Appendix B

Tukey's Analysis of Between Group Differences for Each
Dependent Variable

Dependent Variable	Comparisons	Difference between means
VCOM	Groups 1 and 2	9.399 *
	Groups 1 and 3	11.0 *
	Groups 2 and 3	20.399 *
VDLS	Groups 1 and 2	14.329 *
	Groups 1 and 3	0.231
	Groups 2 and 3	14.559 *
VSOC	Groups 1 and 2	6.441
	Groups 1 and 3	6.0
	Groups 2 and 3	12.441 *
VMOTS	Groups 1 and 2	25.077 *
	Groups 1 and 3	1.923
	Groups 2 and 3	27.0 *
VABC	Groups 1 and 2	16.336 *
	Groups 1 and 3	4.923
	Groups 2 and 3	21.259 *

* $p < .05$ (Group 1 = Language Impaired), (Group 2 = Mentally Retarded)
 (Group 3 = Clinical Control)

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